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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/813,390 | 03/31/2004 | Marcel Gaudet | 250312US6 YA | 5819 |
| 22850 7590 04/19/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314 | | | EXAMINER STOUFFER, KELLY M | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1762 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | NOTIFICATION DATE | DELIVERY MODE |
|--|-------------------|---------------|
| 3 MONTHS | 04/19/2007 | ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/19/2007.

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Office Action Summary

Application No.

10/813,390

Applicant(s)

GAUDET ET AL.

Examiner

Kelly Stouffer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03/12/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948). | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12 March 2007 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-5, 8-10, 13-14, 17-23, 27 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Imai et al. (US 6057247).

Regarding claims 1, 27, and 28, Imai et al. discloses a cleaning method (and therefore an apparatus with means to perform the following method) in a plasma processing system to clean fluoro-carbon polymer from chamber walls (column 11 lines 30-35, among a variety of other placed throughout the document) comprising introducing a process gas including carbon and oxygen into a process chamber of the plasma processing system, generating a plasma from the process gas, exposing residue to the plasma in a dry cleaning process to form a volatile reaction product, and

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exhausting the reaction product from the process chamber (see Embodiment 7 and column 4 lines 25-37).

Regarding claim 3, Imai et al. includes the substrate in the process chamber for cleaning (entire document).

Regarding claim 4, Imai et al. discloses cleaning as a result of a deposition/etching process that is repeated after cleaning (column 18 lines 10-15).

Regarding claim 5, the process gas of Imai et al. may comprise carbon monoxide (Embodiment 7).

Regarding claims 8-10, Imai et al. discloses the claimed flow rates in column 19 lines 14-29.

Regarding claims 13-14, Imai et al. is within the range for chamber pressure required in column 5 lines 25-27.

Regarding claims 17-18, the chamber walls are cleaned for 40 seconds in column 6 lines 54-65.

Regarding claims 19-23, optical monitoring is used for fluorine or carbon monoxide to check the progress of the process and stop the cleaning of the walls, where it is inherent that one could stop the plasma here if only cleaning the walls was desired (column 6 lines 54-65, column 11 lines 31-67).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al. in view of Yeh et al. (US 6545245). Imai et al. includes the limitations of claim 2 as discussed above but does not include a waferless cleaning process to clean the substrate holder. Yeh et al. teaches that one would want to use a dry waferless

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cleaning process to clean polymer residue (similarly to that of Imai et al.) in columns 4-5 lines 62-14.

It would have been obvious to one of ordinary skill in the art to modify Imai et al. to include the cleaning process without anything on the substrate or workpiece holder as taught by Yeh et al. in order to remove build up on the holder and clean the holder.

4. Claims 7, 12, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al.

Regarding claim 7, the examiner takes official notice that it is common in the art to use inert gas/plasma with process gas/plasma and therefore would be obvious to do so.

Regarding claim 12, total gas flows, which would include the inert gas flows, are present in the Embodiments. It is also noted by the examiner that since this claim only requires less than 2000 sccm, it would also include a flow rate of 0 sccm.

Regarding claims 15 and 16, values for RF power applied to coils (upper electrode) and the substrate (lower electrode) are given in the embodiments. It is obvious to one of ordinary skill in the art that RF frequency would correspond to the RF power applied, so having RF power values in that range would also give RF frequency values in the claimed ranges. The power values also depend upon the desired power density of the plasma in column 5 lines 35-40 which would effect cleaning efficiency, so would be a result —effective variable.

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5. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al. in view of Barnes et al. (US 7097716).

Imai et al. includes the limitations of claim 6 and 11 except for one of the gases containing hydrogen or nitrogen as required by the claims. Barnes et al. teaches adding hydrogen gas to cleaning plasma for fluorocarbon polymers because hydrogen helps remove fluorine from reactor surfaces (abstract). In addition, Barnes et al. teaches flow rates of the gas that would be in the claimed ranges in column 5 lines 25-35.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Imai et al. to include using hydrogen gas in the cleaning plasma as taught by Barnes et al. because hydrogen gas helps remove fluorine from reactor surfaces.

6. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imai et al. as applied above, and further in view of US Patent number 5403434 to Moleshi.

Imai et al. is discussed above, but does not include using mass, particle, or plasma monitoring methods to monitor the cleaning process progress. Moleshi teaches adjusting several parameters including these using a process control computer in order to reduce the cleaning exposure time (column 9 line 18-column 15 line 33).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Imai et al. to include using mass, particle, or plasma monitoring

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methods to monitor the cleaning process progress as taught by Moleshi in order to reduce the cleaning exposure time.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly Stouffer whose telephone number is (571) 272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

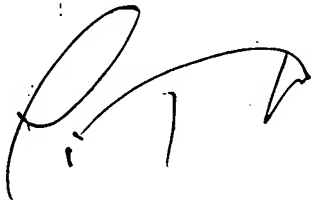
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer
Examiner
Art Unit 1762

kms



TIMOTHY MEES
SUPERVISORY PATENT EXAMINER